

Canberra Botanic Gardens

GROWING NATIVE PLANTS

Vol. 4, 1974



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Billardiera scandens

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NATIVE GROUND COVERS

Although a short article on ground covers was presented in Volume 1 of *Growing Native Plants*, public enquiries have suggested that further information is required on this valuable aspect of landscaping.

Insufficient thought is usually given to the selection of ground covers when setting out a landscape so let us look at the factors which should be considered.

1. What spread is required?

Many times we have seen species used which are too vigorous for a situation and which have completely swamped the surrounding shrubs. Repeated pruning may overcome this excessive growth but it is easier to make the right choice in the first place.

Sometimes the reverse is true and the ground is not sufficiently covered. This may be caused by either incorrect spacing or poor selection of species.

2. Are there trees in the area?

This question is important for two reasons. Firstly, if trees or shrubs are present, then care must be taken to select plants which don't climb into them, unless, of course, this overgrown effect is required. Secondly, if trees are present, they may afford shelter from frost for certain borderline species in colder districts. This gives the landscaper a wider choice.

3. What height is most desirable?

From a purely aesthetic point of view it adds interest to large expanses of ground covers to vary the height. The landscaper should not consider a ground cover to be essentially a prostrate plant. It may be 1 – 1.5 m tall but still hug the ground over a wide basal area and serve the purpose of a ground cover.

Again from a more functional aspect it may be desirable to use a taller species to hide an unsightly structure such as a septic tank or even to divert wind from a certain area.

4. What is the aspect?

This is an obvious question but one that is sometimes forgotten. Some plants thrive in the full western sun, others prefer the shade of a southerly aspect.

5. Is frost a problem?

Those of us resident on the tablelands of New South Wales realise the importance of this question and considerable experience is being gained at Canberra Botanic Gardens in this regard. If the situation is exposed to severe frosts then the selection of species is limited.

If in this article, a species is recorded as frost hardy then it has withstood grass temperatures down to -7°C .

6. Is the drainage good?

With the ever-present danger of *Phytophthora cinnamomi* (root rot) attacking plants in poorly drained situations, this factor should be considered. If the drainage is poor then either efforts should be made to improve it or plant selection should be limited to those species which have shown some resistance to the disease.

7. Is regular watering possible?

This is not a question for the home gardener where watering usually presents no problems. However, in rural or municipal planting or even at the weekend, this is an important factor.

In this article it is proposed to consider a variety of sites and select suitable native species for these. In so doing, the above seven factors will also be considered and it will be left to the landscaper to make his choice.

Sloping banks without trees or shrubs

All species mentioned in this section should not be used when trees or shrubs are in the area as they tend to become tangled in the branches rather than stay on the ground.

1. *Kennedia nigricans*

A very vigorous creeper from West Australia with unusual black and yellow pea flowers and large handsome deep green leaves. One plant will cover an area of 7 m diameter in a season if conditions are good. It is more frost hardy than most other *Kennedia* spp. although its foliage suffers some damage after heavy frosts in Canberra. Leaf damage may also be caused by snails which should be controlled with the usual snail baits.

Propagation is by seed or cuttings taken in September. Seed should be scarified before sowing. Regular watering would be required for good growth.



Hibbertia dentata

2. *Kennedia macrophylla*

This West Australian species is almost as vigorous as *K. nigricans* but has red flowers of the more 'conventional pea flower' shape. Leaves are slightly smaller, paler and less glossy than the former species. Its frost hardiness has not been fully determined as its present location at the Botanic Gardens affords it some shelter. Under these circumstances it is moderately hardy.

Propagation is by cutting or scarified seed. No pests have been noticed for this species and moderate watering is required for good growth.

3. *Kennedia rubicunda*

An eastern species which is becoming well known in cultivation, but which is not as attractive as the two former species. Red flowers are similar in form to *K. nigricans*.

K. rubicunda is frost tender and although not being killed is badly damaged and appears very unsightly by the end of winter.

The species will withstand drier conditions and will survive once established with little or no artificial watering under Canberra rainfall conditions (average annual 660 mm).

It is moderately vigorous (3 m centres) and may be propagated from cuttings or scarified seed.

No pests have been recorded.

4. *Kennedia coccinea*

One of the most beautiful of the *Kennedia* spp., this species is native to south-western Australia where it covers fallen logs and low trees and shrubs. Its flame red flowers are held upright in spring and its dainty foliage is less robust than other species mentioned.

Its resistance to frost has not been fully tested, but some shelter is recommended in Canberra.

In bank planting the suggested spacings would be 1.5 m centres.

Moderate watering is required to maintain the species in good condition.

Propagation is from scarified seed or cuttings and no pests have been recorded.

5. *Hibbertia dentata*

Another east coast species which although frost tender is a delight in a sheltered situation or moderately frost-free area. Its yellow flowers 5 cm in diameter are well presented over a long period. Foliage is attractive and develops a purplish tint in the colder months.

In mass planting, plants should be spaced at 1 m centres as the species is not as vigorous or densely growing as the *Kennedia* spp.

Propagation is from cuttings, but no information is yet available as to success from seed.

No pests have been recorded.

Moderate watering and good drainage is recommended for best growth.

6. *Hardenbergia violacea*

This plant ranges over a wide area of the coast and mountains of eastern Australia. It is a frost hardy species which requires good drainage and relishes dry conditions. Flower colour is generally purple, but pink and white forms are not uncommon. Shrubby forms also exist, but for ground cover work on sloping banks care must be taken to select the trailing form.

Plantings should be kept to 1.5 m centres for dense coverage.

Propagation is best from scarified seed, although for preservation of particular forms, a reasonable strike can be expected from cuttings taken in December.

Apart from the odd caterpillar the species is generally free of insect damage. Care must be taken with drainage as losses from *Phytophthora cinnamomi* (root rot) have been recorded.

7. *Billardiera scandens*

The genus *Billardiera* belongs to the *Pittosporum* family and includes a number of species useful as climbers or ground covers. *B. scandens* is an east coast species which is the most easily available, but by no

means the most attractive. It has, however, the virtue of being frost resistant and hardy. It seems to accept a variety of conditions from dry to moderately damp and from full sun to almost full shade. It is not vigorous and should be planted at 50 cm centres for dense coverage.

The fruit is succulent and edible and propagation is easy from seed or cuttings.

The species appears to be pest free.

Sloping banks with some trees or shrubs or large open areas between shrubs

The species mentioned in this section all have a considerable spread, but tend to stay on the ground rather than become entwined in shrubs and low-hanging trees. Obviously any plant in this section could be used in the previous section.

1. *Kunzea pomifera*

A native of South Australia which demands perfect drainage for good growth. Feathery white flowers borne in late spring and early summer are attractive and the shiny, stiff, small round leaves make the plant an all-the-year favourite.

It is frost hardy and readily propagated from cuttings. No details of propagation from seed are yet available.

Plants must be kept dry once established or almost certain death from root rot will follow.

Spacing at 1 m centres is recommended for massed planting.

2. *Grevillea bitermata*

This West Australian plant is becoming well established as a valuable ground cover for banks in exposed situations. Good examples of its use may be seen on the Sydney-Newcastle expressway. Its white flowers in spring hide the foliage which is attractive in its own right.

Good drainage is preferred and full sun encourages best flowering.

Propagation is easiest from cuttings as seed is difficult to collect in any quantity.

The plant responds well to trimming and if an occasional branch tends to grow vertically it may be cut off at the base if considered undesirable.

No pests are apparent.

Spacing should be at 2 m centres.

3. *Grevillea laurifolia*

From the Blue Mountains, NSW, comes this red flowered, toothbrush Grevillea. In time, a single plant will cover over 6 m square but the species is slow to start and usually requires a couple of seasons to settle down before a good growth is attained.



Phyla nodiflora

Grevillea laurifolia





Cassia odorata

Propagation is easiest from cuttings taken in late summer.

It is frost hardy and does well in full sun.

The species is completely prostrate and has hybridised naturally with *G. acanthifolia* to give another desirable ground cover *G. x gaudichaudii* which seems to be faster growing than *G. laurifolia* with more attractively shaped leaves but less dense habit.

4. *Grevillea thelemanniana*

At least two forms of this species are in cultivation: a grey-leaved form with loosely growing, long, prostrate stems, and another with pale green foliage, slightly more upright and generally more compact. The flower colour on the second form is a paler red and does not show out as well as the former.

The grey-leaved form is the more desirable, but is definitely the more frost tender.

Both grow easily from cuttings taken in summer and both benefit from good drainage.

For dense coverage, it is desirable to space at 1 m centres. No pests have been observed.

5. *Phyla nodiflora* (syn. *Lippia nodiflora*)

From the east coast sand dunes comes this rapid growing verbena-like plant with its small pink flowers and bright green leaves.

It is a prolifically growing plant rooting at the leaf nodes and care should be taken that it is positioned away from garden beds where it is likely to become invasive.

It has been successfully used as a lawn and at Canberra Botanic Gardens has proved highly successful in bank stabilisation.

It is moderately frost hardy although growth ceases in the winter months.

Propagation is most easily achieved by chopping up runners and planting as one would grass runners.

Water should be applied consistently during the warmer months.

6. *Neopaxia australasica* (syn. *Montia australasica*)

This is a plant which thrives in wet conditions and in fact may even be grown as an aquatic.

It is useful as a soil binder, but in the colder areas tends to disappear below ground in the winter months. With bright green, grass-like leaves and small, white star-shaped flowers it is useful for around ornamental pools. It does tend to become invasive and care should be taken to isolate it from areas defined for annuals, etc.

The grey-leaved alpine form of this species appears to be less invasive, but requires further testing before it can be recommended.

Propagation is by root division and plantlets may be positioned directly provided adequate watering is carried out.

7. *Cassia odorata* (prostrate form)

A form of *Cassia odorata* from the south coast of New South Wales exhibits a completely prostrate habit making it eminently suitable for ground cover work. Unlike many other *Cassias* it has shown itself to be moderately frost hardy in Canberra and reasonably quick growing.

With masses of yellow flowers in late spring and early summer, it is an eye catcher for a sunny situation. A plant will cover about 1.5 m in the first two growing seasons.

Propagation is from seed and the only observed pest is grubs in the seed pods.

8. *Kennedia prostrata*

Common right across the Continent, this species is one of the few *Kennedia* spp. that stays on the ground.

It is frost tender and will only survive under shelter in Canberra.

Propagation is from scarified seed or cuttings.

It forms a tight mat and is fast growing in a sunny situation although the red flowers are often hidden by the leaves.

Spacing at 2 m centres is suggested and no pests have been observed.

9. *Myoporum debile*

This inland species is sometimes found naturalised on coastal areas and is thought to be introduced by cattle.

It is slightly frost tender in Canberra but recovers to flower through the summer and fruit in the autumn. Flowers are small and white, but the fruits are red to purple and quite showy.

Propagation is easy from cuttings, but little is known about germination from seed.

For a dense coverage 1 m centres or less is the recommended spacing. No pests have been observed.



Brachysema lanceolatum

10. *Mentha diemenica*

Little has been done with our native mints in cultivation, but this species is worthy of trial.

Being native to the Australian Capital Territory it is frost hardy and thrives on ample watering.

Its blue flowers are borne in summer, and may be propagated from cuttings or root division.

Small plants should be placed at 50 cm centres. No pests noted.

11. *Hibbertia scandens*

A vigorous creeper of the east coast sand dunes, but one which will only survive in Canberra with winter covering. Its large, showy yellow flowers are up to 7 cm in diameter and appear right through the warmer months.

Propagation is by cuttings, although little work has been done on *Hibbertia* from seed.

A well-drained situation is required, but adequate watering is also necessary.

Plant at 1.5 m centres on the coast and 1 m centres under shelter inland.

No pests noted.

12. *Carpobrotus rossii*

There are a number of Australian succulent plants suitable for ground cover work in extremely dry areas, the genera *Carpobrotus*

and *Disphyma* being outstanding.

C. rossii has purple flowers about 5 cm in diameter and can withstand grass temperatures to -7°C without damage.

Propagation is easy from cuttings with roots appearing in 7–10 days.

Snails should be guarded against with the recommended baits.

Suitable spacing would be 1 m – 1.5 m.

13. *Synaphea reticulata*

This species is included as a plant worthy of trial as nothing is known of its performance in eastern Australia. Cuttings taken in October 1968 in West Australia failed in Canberra Botanic Gardens, probably due to the hard wood available. In January, better results should be obtained. Foliage is a pale green and flowers are sulphur yellow. A mature plant may cover densely a circle of 2 m diameter to a height of 20 to 30 cm.

The genus *Synaphea* has been largely neglected in cultivation. Let us remedy this in the future.

Areas where some height is required in a ground cover

1. *Bauera rubioides*

Well known in sheltered damp situations along the east coast, this shrub has proved extremely adaptable in exposed full sun posi-



Casuarina nana

tions in Canberra. In such a location, the height is restricted to about 1 m with a spread of at least 1.5 m.

The species flowers for long periods and is one of the most resistant we have yet observed to *Phytophthora cinnamomi*.

Propagation is by cutting taken at any time of the year.

Frost is not a problem and no pests have been observed.

The shrub appreciates adequate water, but will withstand drought. It appears that good drainage is not important.

In summary, this hardy species should be used in parks and gardens far more than it is at present.

2. *Brachysema lanceolatum*

A red pea flower of West Australia and one which has become well known in cultivation in the east.

Its flowers are not well displayed, but its glaucous foliage and spreading habit make it useful particularly for park work.

It is frost hardy and resistant to pests and diseases provided reasonable drainage is available.

Propagation is either from scarified seed or cuttings.

If conditions are suitable an expected spread of at least 2.5 m can be expected

with a height of 1.5 m.

3. *Micromyrtus ciliata*

This eastern species is variable and only the semi-prostrate form is suitable for ground cover work. It will spread to 1.5 m and remain about 50 cm high.

The white flowers redden on ageing and the bush remains attractive for many weeks.

It is frost hardy, but requires good drainage. Apart from occasional attack by scale insects, pests are not a problem.

Propagation is from short tip cuttings taken in summer when new growth has started to harden.

4. *Casuarina nana*

One does not normally think of *Casuarina* spp. as ground covers, but there are several species suitable for this type of use. *C. nana*, which grows in the Royal National Park near Sydney is one. Rarely more than 1 m high and with a spread of 2–3 m, it is tolerant of a wide variety of conditions.

Propagation is from seed and young plants should be protected from hares and rabbits until they are established. It is frost hardy.

Casuarinas make an interesting foliage contrast whether as ground covers or specimen trees and more use should be made of the genus in the planning of parks and private gardens.

5. *Acacia glandulicarpa*

Several *Acacias* are useful ground covers because of their low spreading habit. This species is Victorian and at 1 m high has a spread of over 2 m.

It is spring flowering with a good covering of small golden balls. Propagation is from scarified seed, and some small successes have been had from cuttings.

It is not worried by frosts.

It appreciates a well-drained spot in full sun and as with most *Acacias* it is prone to borer attack.

6. *Haloragis monosperma*

Collected in the Budawang Ranges of southern New South Wales, this species is not common in cultivation. It is, however, fast growing with bright green foliage and cream flowers in the spring.

Plants should be spaced at 2 m centres and expected height should be about 1.5 m.

This species is frost hardy and may be grown easily from cuttings. No pests have been recorded, but adequate water and good drainage should be provided.

7. *Helichrysum hookeri*

A Snowy Mountains species which so far

is not known in general cultivation. It is low and compact forming a rounded bush about 50 cm high. In mass planting, it should be used at 70 cm centres as it is reasonably slow growing. Flowers are cream and cover the bush in late spring and early summer. When the plant is out of flower its minute leaves give it the appearance of a dwarf conifer.

Propagation is easy from cuttings and no data is yet available on seed germination.

No pests have been observed.

8. *Grevillea paniculata*

Some forms of this West Australian plant tend to be low and spreading and are suited for ground covers.

The species has prickly foliage and would be useful for deterring animals or children. In flower it is a mass of cream, highly scented blossoms, but at other times its fresh, light green foliage is attractive.

Good forms will spread to 2.5 m with a height of 1 – 1.5 m.

Propagation is from cuttings, no pests have been noted and the species is frost hardy.

A sunny, well-drained position will suit it best.

Grevillea paniculata



9. *Melaleuca pulchella*, *M. scabra*, *M. violacea*

These three mauve flowered *Melaleuca* spp. from West Australia may be bracketed together as their requirements for cultivation are similar.

All have forms which are low spreading shrubs to about 1 m with 1.5 – 2 m spread.

All require plenty of water although good drainage is an advantage.

Propagation is either from seed or cuttings but to preserve the required form vegetative material is desirable.

The three species flower in late spring and early summer and appear to be pest free. All are frost hardy at the Botanic Gardens.

Care must be taken in selection of the correct form as more upright types of all three also exist.

Small areas between shrubs, between driveway strips, or in rockery pockets

1. *Scaevola albid*

All *Scaevola* spp. are useful rockery plants and many are dense enough to be classed as ground covers. *S. albid*, in either white or blue colour forms, is a close mat which may spread to 1 m or 1.5 m and remains mostly prostrate, although the blue form may reach 50 cm high.

It grows readily from cuttings and requires ample moisture and good drainage.

Full sun or semi-shade location are satisfactory and the species is frost hardy.

Propagate from cuttings, no pests noted.

2. *Ajuga australis*

Our plants were collected in South Australia and have done well in full sun and exposed to frosts.

The purplish, blue flowers are borne on upright stems in spring and summer and in four years the plants have spread to about 1 m in diameter.

The plant may be propagated from cuttings or root division and appears to be pest free.

3. *Clianthus formosus*

This species needs no introduction to most Australians. Better known as Sturt's Desert Pea, it is the floral emblem of South Australia.

It requires dry, well-drained conditions and although frost tender is worth growing as an annual in cold areas.

If scarified seed is sown in July in cold climates, plants may be nurtured in large pots in cold frames until the heavy frosts have passed, say early September. The advanced plants are then planted in the open garden and covered for the first two weeks. Flowering should start almost immediately. Liberal



Ajuga australis

application of a well-balanced fertiliser at planting time is an advantage.

Care should be taken not to overwater and drainage must be excellent.

Snails should be guarded against by using bait.

Spacing for mass planting should be no more than 1 m centres.

4. *Pelargonium rodneyanum*

One of the best of the Australian Pelargoniums, this species hails from the Grampians in Victoria.

It is readily propagated from cuttings and enjoys full sun. It spreads slowly and as a ground cover it should be planted at 50 cm centres.

On trial now for six years in Canberra, it is frost hardy and flowers for a long period over the warmer months.

Moderate watering is required and no pests have been noted.

5. *Brachycome graminea*

This is a plant of the east coast swamplands which is excellent for a damp location. It covers rapidly and may be propagated best by root division.

Plants at Canberra Botanic Gardens are frost hardy and flowers are borne through the warmer months until late autumn.

The little daisy flowers are white or pale blue and no pests have been recorded.

Plenty of water is required for good growth

and small plantlets should be placed at 30 cm centres for quick coverage.

6. *Triodia irritans*

Despised by many and as far as is known not used in cultivation, the Australian spinifex is suggested as a ground cover for arid conditions or as a rockery novelty.

It grows easily from seed and forms a rounded clump some 70 cm in diameter.

Although it grows in low rainfall areas it thrives on the kinder conditions of cultivation.

Its heads of flowers are pleasing, but insufficient evidence so far exists as to whether the species will escape and become a nuisance.

It appears to be frost hardy.

7. *Pultenaea capitata*

This final species has been included as a suggestion for experimentation.

Native to the Lake King area of West Australia, the plant makes a superb mat 60 cm or more across with large heads of orange-brown pea flowers.

Cuttings failed at Canberra when taken in spring as no suitable material was available. It is felt that if seed was available or cuttings were taken in January success would be fairly certain.

No evidence is available as to its performance in cultivation, but having seen it in the wild it is assuredly worth a try.

NAME MEANINGS

Kennedia—after Lewis Kennedy, a London nurseryman; *nigricans*—black, the unusual flowers are black with yellow on the standard; *macrophylla*—from the Greek, macro, long, phylla, leaves; *rubicunda*—reddish, referring to the dark red pea-shaped flowers, *coccinea*—scarlet, bears clusters of red and orange flowers; *prostrata*—prostrate, lying flat.

Hibbertia—after George Hibbert, a London patron of botany; *dentata*—toothed, alluding to the leaf margins; *scandens*—climbing (tendency to climb).

Hardenbergia—after the Countess von Hardenberg, a sister of Baron von Hugel who collected plants in West Australia in 1833; *violacea*—violet in colour.

Billardiera—after Jacques Labillardiere, a French botanist; *scandens*—climbing, a bushy shrub with a tendency to climb.

Kunzea—after Gustave Kunze, a German botanist; *pomifera*—derived from two Latin words meaning fruit-bearing (the large fleshy seeds are edible).

Grevillea—after C. F. Greville, a patron of botany (English); *bitermata*—referring to the leaves which are arranged in two clusters of threes; x *gaudichaudii*—after a French botanist, C. Gaudichaud Beaupre; a natural hybrid, *G. laurifolia* x *G. acanthifolia*; *thelemanniana*—after Thelemann, a German bot-

Pelargonium rodneyanum





Brachycome graminea

anist of the early 1800s; *paniculata*—flowers, arranged in panicles; *laurifolia*—with laurel leaves.

Bauera—after the Bauer brothers, early botanical illustrators; *rubroides*—resembling another plant, the Rubbia or Madder.

Helichrysum—derived from two Greek words, helios, the sun, and chrysos, gold, alluding to the bright flowers of some species; *hookeri*—after Sir Joseph Dalton Hooker, an early director of Kew Gardens.

Micromyrtus—from two Greek words, micro, small, myrtus, the myrtle; *ciliata*—fringed, alluding to minute, stiff hairs on leaf margins.

Casuarina—meaning the Cassowary, because the drooping foliage was said to resemble the feathers of that bird; *nana*—dwarf.

Acacia—from the Greek akazo, to sharpen, probably in reference to prickly species first discovered, or 'akakia', the Egyptian Thorn which yields gum arabic; *glandulicarpa*—from the Latin, glanduli, glandular, and the Greek, carpos, fruit, possibly alluding to glands at base of hairs on the pod.

Haloragis—from the Greek, halos, the sea,

rhagos, a grape berry (because of locality and appearance of fruit in first New Zealand species found); *monosperma*—one seeded.

Brachysema—derived from the Greek, brachys, short, sema, standard (alluding to the pea flowers); *lanceolatum*—leaves lance-like in form.

Melaleuca—from the Greek, melas, black, and leukos, white, as the first *Melaleuca* discovered had white branches but a black trunk, possibly from fire. Another opinion contrasts the white bark with the very dark foliage of some species; *pulchella*—beautiful; *scabra*—rough to the touch; *violacea*—violet coloured.

Scaevola—from the Latin, scavus, alluding to the one-sided, fan-shaped corolla; *albida*—whitish or nearly white.

Ajuga—from the Latin, a, no, zugon, a yoke, in reference to the calyx lobes being equal, not bilabiate; *australis*—southern.

Clianthus—from Greek, kleos, glory, anthos, flower; *formosus*—beautiful.

Pelargonium—from the Greek, pelargos, stork (the fruit is long and slender like a stork's bill); *rodneyanum*—named in honour of Mrs Riddell, grand-daughter of the famous English admiral, Baron George Brydges Rodney, at Sydney in 1839.

Brachycome—from the Greek, brakhys, short, kome, a head of hair; *graminea*—grass-like, referring to the narrow leaves.

Triodia—from the Greek, treis, three, odon, a tooth (the flowering glume is divided into three lobes); *irritans*—irritating, referring to pungent pointed leaves.

Pultenaea—after Richard Pulteney, an English botanist; *capitata*—flowers in heads.

Phyla—from the Greek, phule, tribe, connection unknown (Phylum is a division of the plant or animal kingdom); *nodiflora*—with flowers at the nodes.

Neopaxia—from neo, later, and F. Pax, a German botanist (original name was Paxia); *australasica*—of Australian origin.

Cassia—Greco-Latin word used to denote a sort of cinnamon bark; *odorata*—sweet smelling.

Myoporum—meaning closed pores, referring to the closed pores; *debile*—weak.

Mentha—the Latin name of mint; *diemenica*—of Tasmania, Van Diemen's Land, where the species grows.

Synaphea—from two Greek words, together and touch, alluding to some flower parts being united; *reticulata*—netted, referring to leaf venation.

Carpobrotus—from the Greek, carpos, fruit, brotos, edible; *rossii*—after William Ross-Stoke, of Newington, England, who raised plants from seed from Tasmania.

MELALEUCA MICROMERA

Melaleuca micromera is an unusual shrub from the south-east of West Australia where it grows on dry, sandy plains and in gravelly habitats. It makes a large shrub, low and spreading, or compact and upright when it is described as resembling a small conifer.

Like many *Melaleuca* spp. it is attractive in foliage and flower, but unique among them; in fact it is a distinctive species for any kind of garden on account of its twisting branches.

Growth is dry and slender, easily snapped, though pliant in wind in all situations in Canberra Botanic Gardens. The lightweight branches are greyish brown and they curve, twist and wave in various directions. Numerous short, fine lateral stems often form feathery tufts, slightly matted.

Specimens in these gardens are in sheltered positions favouring free growth, in light shade from Eucalyptus and taller shrubs. The soil is light and mulched with bark chips and leaves, watered moderately and fed occasionally with blood and bone and 10:9:8 fertilizer around each plant.

Isolated plants are upright, 1.5 m high at eight years old spreading 1.5–2 m across. Plants confined among other shrubs are irregular, reaching along the ground to the front of the border and fitting gracefully into available space. This is an important point in a closely planted border.

The shrubs are completely winter hardy in Canberra, and in drought years they survived though growing bare. Bushy growth to ground level was resumed as soon as more watering became available.

The light stems show up looking as if threaded through the minute scale-like leaves, for each leaf has one face pressed closely on the stem. On some stems continuous foliage gives the effect of a fine green cord.

Under a hand lens the details of the curious leaves can be seen. They are in whorls of three, roughly shield-shaped and for their size quite thick and succulent with one or two dots—the oil glands. When a few leaves

are crushed the glands release a perfume typical of the family *Myrtaceae*, in which all leaves have these glands.

Most of the year the shrubs are a quiet green, freshened by paler tints in spring when new tips are growing before the flowers are finished.

This is the earliest spring flowering *Melaleuca* in the Gardens, opening even in late July some years on sheltered branches. Early October is more usual and flowers open for about five weeks, at the tips of most laterals and often massed.

The flowers are as unusual as the leaves and the branching, resembling Wattle balls just under 1 cm across. Actually they are 'brush' flowers as in many *Melaleuca* spp., but rounded; the colour is Barium yellow as matched with a colour chart, and recorded also for some Wattles.

Seed capsules embedded in the wood remain unopened on the plant for years, and to obtain the seed a piece of stem can be kept indoors in a bag, the capsules opening in a few days in a warm room. New plants are raised from seed or cuttings, but are not easily bought as the species is not yet widely known in cultivation.

Cut stems are ornate in decoration and last well in shallow water, gradually drying out quite usefully. One flexible stem alone makes a small arrangement, falling easily into various graceful positions when wedged among small rocks on a pinholder.

This long-lived and trouble-free shrub will become popular for small spaces and is recommended also for growing in tubs or cascading among large rocks or down a slope. It can be trimmed to shape as a small hedge, with plants about 1 m apart.

Melaleuca micromera:
Melaleuca—from the Greek, melas, black, and leukos, white, as the first *Melaleuca* discovered had white branches but a black trunk, possibly from fire. Another opinion contrasts the white bark with the very dark foliage of some species; *micromera*—from two Greek words meaning small and parts, an apt reference



EUCALYPTUS CAESIA

Gungurru is the Aboriginal name of this colourful small tree though its meaning is lost and there are few living members of the tribe concerned*. The species is popular in Australian gardens far beyond its granite habitats in south-west Australia, and it is often supplied by nurseries dealing in native plants.

The size is very convenient, the tree only being about 5 m high, extremely slender and with pendulous branches. Other attractions are pink flowers and dark ruby red stems¹ overlaid with a white waxy bloom. Buds, seed capsules and young branches are also silvery, enhanced when the plant is in full sun. The bark is an unusual reddish brown

Eucalyptus caesia:

Eucalyptus—from Greek words, eu, good or well, and kalypso, meaning one cover, alluding to the calyx which forms a close lid over the flower bud; *caesia*—from the Latin word meaning bluish (the leaves)



and smooth, splitting longitudinally into narrow, tough curls which are tight on the trunk most of the year.

A once weather-battered example in Canberra Botanic Gardens was planted about 1959 in an open lawn area on a slight slope; it now has a trunk 20 cm across, thickened and suckering at ground level. After it had grown 5 m high a hot summer gale snapped off several main branches; then a snowfall the next August (1965) broke off the trunk 2 m above the ground. The apparently dead stump burst into growth the following year and regained the lost height, showing that the species recovers from setbacks and can be trimmed. Trimming is generally needed to make a shapely and more bushy tree.

Normally this Eucalypt is unaffected by frost in Canberra and survives drought, though flowers may be absent and no progress made without watering in dry spells.

The leaves seem the least attraction, though blue-green when healthy and silvery when young. They are up to 13 cm long, thick and with a red vein, sparse in number. Unfortunately, they are often eaten by insects and blemished by high-coloured marks in wet winters.

Scale pests increase some years, encouraging sooty mould and attracting ants. The entire tree can be disfigured, and should be watched so that spraying can be done at the start of the trouble.

Flowers open from early September, lasting until mid-December with moisture. They are in clusters of three, dangling on long stems on the swaying branchlets and not hidden by foliage. They are quite large, 3 cm across, a fringe of firm stamens around a large light yellow eye. The colour is soft rose pink² tipped with pale yellow anthers³ in silvery cups. The seed capsules are shapely, like small silvery bells.

Small Eucalyptus and Mallee types can be most ornamental and a number are in cultivation. Their flower colours include good creams, pinks, reds, green or mauve.

The interesting bark of Gungurru is found also in several other small Eucalypts from granite country in West Australia. *E. orbifolia* (Disc-leaf Mallee) is a highly ornamental example, with thick, grey, rounded leaves and large primrose yellow flowers. Examples can be seen in Canberra Botanic Gardens.

* Department of Aboriginal Affairs, Canberra.

1. RHS Colour Chart, 1941, ruby red 827; 1966, red-purple 59A.

2. RHS Colour Chart, 1941, carmine rose 621/1 for example; 1966, red 58D for example.

3. RHS Colour Chart, 1941, chrome yellow 605/1-2; 1966, yellow-orange 16C.

BORONIA PINNATA

Boronia pinnata:

Boronia—after F. Borone, an Italian plant collector 1769-94;
pinnata—Latin, feathered, alluding to the divided leaves

Many gardeners, whether native plant enthusiasts or not, aim to grow precious *Boronias*, and specially the brown *Boronia megastigma* which is not the easiest to keep.

Boronia pinnata, shown here, is a tougher species and can be long-lived in a sheltered spot and with light trimming. The oldest specimen in Canberra Botanic Gardens is an example dating from 1962, and it has out-lived the other most vigorous species, *B. heterophylla*, described in Volume 1 of *Growing Native Plants*.

This *Boronia* is a beautiful waxy-flowered delicate shrub, not sweetly perfumed but with aromatic leaves which when bruised yield a perfume that may not appeal to all. An interesting scent is noticed on smelling the flowers, but it does not scent the air.

It is one of the common *Boronia* spp. of sandstone country in New South Wales up to lesser mountain levels. It grows in dry sclerophyll forests and in well-drained sandy heaths where crowded among other shrubs it can be over 1.5 m high, slender and arching.

The species varies and can be very soft with weeping tips and pale mauve flowers¹, occasionally white. A slightly more robust and upright form is often seen with stems or leaves tinged purple and with light purple



flowers². During August the clear, bright colours are seen from a distance.

As *Boronia pinnata* is very similar to several other *Boronia* spp., with slight differences such as fine hairs on young growth, it

was formerly recorded as growing in other eastern States. In present classification it is considered a New South Wales species.

The oldest specimen referred to earlier came from a small batch of cuttings collected in 1961, planted out seven months later, and flowering in September at 16 months old. It was put in a small clearing on a gentle slope and in full sun, with sandy loam among rocks.

It survived droughts and hot winds which often cut it back. Nearby growing shrubs began to cast shade and the shrub withstood frosts. Now 11 years old, it is strongly established, 1.5 m high and wider, with several main branches thick at ground level.

The tips arch and bushy growth is maintained with sprinkler watering when necessary and with light dressings of blood and bone.

Younger examples in partial shade with deep light soil over sandstone, have never had a drought check and have grown rapidly. They are graceful, upright, arching shrubs of the same height, leafy to ground level.

All parts of the plant are delicate, hairless and waxy, easily broken or spoilt by intense sun or strong winds. A setting among rocks is useful for keeping the root area cool. If it is felt that no position in the garden is sheltered enough, it may be possible to grow the shrub in a tub or large pot, moved into the shade as necessary.

It was as pot plants that *Boronia* spp. were first widely grown in Europe after discovery.

Plant form may be low or spreading, encouraged if desired by trimming.

The foliage of a sheltered plant is ornamental and ferny, light to mid-green. The leaves are up to 25 mm long, opposite, and with several pairs of widely spaced leaflets.

Flowering starts in early September in Canberra and can last till early December; it is at its best all October. The flowers are clustered on slender stems, roundish buds opening to cups about 1 cm diameter and of four pointed petals. The quality is waxy and translucent, the colours pure hues and tints.

Some seed sets in Canberra; however, cuttings are generally used in propagation, taking half-ripe tip growth in early summer or later.

Boronias are generally long-lasting as cut flowers, and by taking short sprays for the house this species is given the little trimming it needs to avoid bare wood.



Boronia pinnata

1. RHS Colour Chart, 1941, mauve 633/2-3; 1966, purple 75C.

2. RHS Colour Chart, 1941, orchid purple 31/1-2; 1966, red-purple 72B and C.

HAKEA VERRUCOSA

Warty-fruited *Hakea* is an interesting shrub from open, sandy and gravelly habitats in West Australia, little-known in gardens of eastern Australia. Its attractions are winter flowering and compact healthy growth of medium size. It was introduced to Canberra Botanic Gardens in 1963.

Plants raised from seed were planted in light soil in full sun near trees and during drought years they merely hung on. Steady growth began when sprinklers were installed and later bark mulches were laid down. Several survivors are up to 1.5 m high at nine years old and are still growing.

These are upright, rigid shrubs with several thick main branches at ground level. These branch densely at short intervals, aided occasionally by frost killing a few half-ripe tips which acts as light trimming. In some Canberra districts it would be advisable to cover young plants on winter nights. Hessian can be supported on stakes, clear of the plant, for the cold reaches any part of the plant where the hessian rests.

The leaves are thick spines 6 cm long resembling those of other 'needle' *Hakea* spp. and very healthy, impervious to attack by most pests and diseases. A safe garden position should be chosen and the species makes an excellent barrier as a lightly trimmed hedge to 2 m high if desired.

In general effect the foliage is pleasant with its healthy, mid-green colour and lighter tip growth in summer and autumn.

Plants can flower while young and a specimen was seen to flower at 30 cm high when about a year old. On a watered plant the season can start in late April and last till September; it is at its best during a long period between June and August. In extreme cold with dryness the display is sparse or absent.

At best the shrubs are massed with delicate flowers among the sharp spines, stemless on the hard wood. They are narrowly tubular with long styles, scentless and waxy, hanging softly in clusters of several flowers



Hakea verrucosa:

Hakea—after Baron von Hake, a German patron of botany; *verrucosa*—warted, alluding to the woody fruits

or fanning out almost in a wheel 6 cm across. Bees are frequently seen visiting the flowers.

The flower colour is subtle and difficult to record, as in many other members of the plant family *Proteaceae*. It is a suffused mixture of ruby reds and light purples¹ which may chill to cold mauves in a severe wintry spell.

A few small woody fruits are seen some years. Apart from seed, half-ripe cuttings can be used in propagation. The species is not yet well enough known to be in plentiful supply, but can be bought from some specialist nurseries. No special soil requirements are known, but the plants should be put in sunny positions for good flowering.

The shrub has recovered from drought and also from spells of bad drainage, as during a rainy spell when the root-rot fungus, *Phytophthora cinnamomi*, caused some die-back. This had a similar trimming effect to frost and did no permanent damage to established plants.

This is a useless cut flower, not living in water. The stiff pieces are hard to arrange and the colour, so bright in the winter garden, seems cold indoors.

1. RHS Colour Chart, 1941, ruby red 827/3 or Indian lake 826/3 with styles of magneta rose 027/1; 1966, red-purple 61A-B with styles red-purple 64C.

MELALEUCA THYMIFOLIA

From the many small *Melaleucas* of garden value, *Melaleuca thymifolia* (Thyme-leaf Honey-myrtle) is chosen for its frequent flowers and general adaptability for a small garden or public park. It comes from New South Wales and Queensland in mild, moist areas and light soils, but has not needed protection in Canberra Botanic Gardens and has survived droughts. In extreme cold exposed plants can look chilled.

Watered shrubs are luxuriant and full of long, straight tip growths. Really heavy watering or high rainfall brings beautiful large, soft flowers in profusion, but plants fall apart, revealing tough papery branches. The branches recover, however, by curving inwards again and pruning is seldom necessary to keep a shapely plant.

In Canberra Botanic Gardens, the largest plant of this species is over 1.5 m high in a very enclosed position among taller shrubs. Another, in light soil and well watered is a definite ground cover 3 m across and under 1 m high at 10 years old. Some of a similar age are nearly flat-topped, or irregular small shrubs under 1 m.

Specimens in drier conditions in full sun, as on a lawn, are compact small shrubs of 1 m at 10 years old, tending to develop short trunks. Growth is in tufts of thin stems more towards the branch ends and the bare wood has many clusters of old seed capsules.

It is long-lived and recovers well from drought and other setbacks, though exposure to strong winds can cause a permanent lean, or plants may even be dislodged.

Over 15 specimens are in the Canberra Gardens, from several origins, showing interesting variations in shape and size and indicating that treatment can be aimed at having the type of plant desired. It could be used in a rockery, in group planting in public parks, or for extensive ground covers lightly trimmed.

The plant is entirely hairless with delicate reddish young stems and blue-green foliage, both spicily aromatic when bruised. The

simple leaves are about 1 cm long in even pairs pointing upwards close to the stems.

On ripe wood, below the new tips, are small clusters of stemless flowers, rich mauve in spring and summer and bluish purple in early winter in Canberra. They are the 'claw' type of flower in which the stamens are joined lower down and free towards the tips where they curve inwards. They are like five feathered petals of firm substance.

Altogether flowers often open eight months of the year, freely around late November and then slowly till autumn when another flush occurs. After this flowers open unevenly depending on the weather and finally cease towards mid-winter, full of buds for next spring.

Propagation is not difficult and the species is generally obtainable from nurseries dealing in native plants. Seed can be collected by taking mature capsules and keeping them indoors to open in a bag, or cuttings may be taken from the plentiful tip growths in December or January.

This charming shrub seems to thrive in any soil with little attention besides trimming, and is free from pests and diseases.

Melaleuca thymifolia:
Melaleuca—from two Greek words, melas, black, and leukos, white, as the first *Melaleuca* discovered had white branches but a black trunk, possibly from fire. Another opinion contrasts the white bark with the very dark foliage of some species; *thymifolia*—thyme-leaved, a name sometimes given to plants with this type of similar leaf



VIMINARIA JUNCEA

Viminaria juncea:
Viminaria—from the Latin,
vimen, a pliant twig;
juncea—rush-like



Native Broom is a unique species, being the only *Viminaria* known, and it grows wild only in Australia. It occurs in moist temperate parts of most States, not in Tasmania or in areas as dry as the Australian Capital Territory. In swamps it can be extensive, a tall loose shrub where crowded.

It can be kept as a shrub amenable to trimming, but is most distinctive kept to a single trunk when it reaches 6 m high. As a shrub it resembles the introduced Broom (hence the common name), with smaller flowers, but is highly superior. It is brighter in appearance and unlike Broom will grow again after setbacks, thus it is long-lived.

As a small tree it is upright and the slender trunk has a dark fibrous bark. It contrasts with the crown of soft green tints, a waving mass of slender branches which are bright grassy green while young. They are long, in sprays, very smooth and extremely pliant, standing up well to storms and not angular.

Ordinary leaves are absent, except in seedlings and occasionally on young stems, and the tree is generally thought of as leafless. The leaves are only minute scales and the mass of growth consists of phyllodes, as in some Acacias.

In *V. juncea* the phyllodes are 25 mm long, stringy, smooth and flexible, a fresh green and always healthy.

Very rapid, clean growth in almost any soil is a great advantage of the species which can be put to any garden use in sun or shade. It is tough enough for planting in public gardens and quite hardy to frost in Canberra.

An older specimen in Canberra Botanic Gardens survived droughts though growth receded to the top of the tree, and it withstood storms in a fairly open spot. When 6 m high it lost three branches in the August 1965 snowfall, and further dieback came possibly through root-rot (*Phytophthora cinnamomi*) which was known to be in the area. After trimming and with controlled sprinkler watering, this tree grew bushy again.

In November the branches became thickly lined with small, lemon-yellow¹ pea flowers 1 cm long, lightly clover-scented from a large mass of plants. The season can last till mid-December if cool and moist.

Seed sets in plenty, one small bean per pod, and is the easy means of propagation making this species fairly readily obtained from native plant nurseries, though it is not yet widely known. Autumn would be the best season to put out new plants in Canberra.

This is not a useful cut flower.

1. RHS Colour Chart, 1941, lemon yellow 4; 1966, yellow 13A.

CASSINIA QUINQUEFARIA

When growing wild, looking tattered and wispy with an outline of flimsy small foliage, this shrub of the Daisy family is generally classed as rubbish if noticed at all. It is no garden plant even to most native plant enthusiasts, but in cleared surroundings with some trimming and watering two attractive features emerge.

The feathery flower clusters, stunted and dingy when wild, become large and shapely in cultivation, and the foliage is aromatic. The shrub is easy to grow, making very rapid progress in most soils unless over-wet.

There is no very familiar common name and the species is not in old books showing native plants tried out in Europe soon after discovery. In 1817 its botanical description was recorded, but popular accounts of it are not to be found.

In the dry forests of eastern New South Wales the species is very common where found. It occurs at the coast, up to 1.5 m high growing among sand-dune shrubbery, but is more evident inland. It is found in rocky, arid situations and in moister patches, often in tumbled down thickets over 3 m high.

The shrub is common on Canberra mountains, and continues to survive by dusty outer roadsides. Plants can be spotted in summer by their terminal flower clusters of dull greenish and straw colours.

Many young plants spring up on cleared bushlands, racing ahead in the open to form upright, dense and leafy shrubs 2 m high in several years. They then tend to deteriorate and grow bare at the base.

Wild shrubs in better sites may develop a few main branches with age, even a short trunk where the bark is dark, toughly fibrous and almost latticed. Drier shrubs may have numerous, very thin stems. The wood is hard and brittle with thin, dark and rough bark. Extremely thin, weak growth which dies out easily in dry spells is a conspicuous feature of this shrub.

In good or poor conditions the branches



Cassinia quinquefaria:
Cassinia—after Count Henri Cassini, 1781-1832, French botanist and writer on the plant family *Compositae*; *quinquefaria*—five-fold, i.e. with five florets, alluding to the flower structure

are short-lived going bare from the base and causing a litter of dead stems over the years. As the basal shoots grow long and straight there are generally numerous thin, strong sticks lying around untended plants and these are good for light garden stakes.

In nature the shrubs are indestructible with the frames under constant replacement as new growth is made after only light rains. New shoots spring oddly anywhere on the plants leading to erratic plant shapes, more or less upright, sparse or bushy. This infers that the shrub can be trimmed freely, and can hardly be spoilt by wrong treatment. The aim is to keep a plant leafy and shapely by cutting out old wood.

Leaves are up to 4 cm long, narrow, very thin and slightly sticky in a damp atmosphere. Though dull and drooping in the wild, the foliage on trimmed and watered plants is soft and feathery, pine-green and with a varnish-like shine.

The aroma noticed on brushing past the plant is like a faint copy of the highly perfumed *Humea elegans*, the 'incense plant' of

the Daisy family. This biennial from Victoria and New South Wales has been in overseas glasshouses since first discovery and *Cassinia quinquefaria* might have the same pleasant use, as the scent is noticed more in a damp atmosphere.

The scent of the flowers when fully out on a damp midsummer day may be too strong for some senses, but is generally pleasant.

Flowers are the main attraction of the cultivated shrub—delicate feathery clusters all over a shrub in the sun. Shaded plants may have taller, arching branches tipped with large graceful clusters, as on the banks of the Rainforest Gully at Canberra Botanic Gardens.

Pointed green buds appear in December and open in January and February to tiny fringed flowers which catch the eye of visitors. Though without bright colour they are attractive due to a slight metallic sheen. When magnified this is seen to be due to shiny papery scales around the flowers.

The straw-tinted flowers pale after seeding, still decorative, for the clusters though very fragile are everlasting. They hold long into a calm winter, finally turning dark and falling into decay—in early spring in some mild years.

As a cut flower the species is more useful than might be imagined with a similar use to perennial *Gypsophila* or *Statice*, but more shapely. The featherweight stems are easy to arrange in large or small displays, in deep

or shallow water. There they can be left to dry out for later use, though the leaves drop off. Around them hangs the spicy aroma for a long time.

The species is not yet for sale, but plants can easily be acquired and handed round by gardeners who discover them in their new gardens. Small plants move easily in damp conditions and can be put in sun or shade. They are useful for any garden purpose, but especially for rapid fence cover or a soft hedge. They are less suitable where bold specimens are wanted, as on a lawn, and would become dusty and dishevelled in city surroundings in public areas.

Disorders seen on wild plants include a small yellowish leaf gall seen under a microscope to contain mites, and affected stems should be cut out.

The brittle stems have also had breakage, occasionally in storms. Several inches of snow in 1965 caused further breakage.

The only effect of these setbacks was to add to the litter of sticks, and new suckers and seedlings were plentiful.

Cassinia spp. are tall shrubs of the southern hemisphere, and about 18 of them are found wild only in Australia. They also have stiff, brittle stems. Four other species than the one shown here are wild in the ACT, though less common. Some species are showy garden subjects with rounded or flatter flower clusters, white, pink, or yellow, and are popular with native plant growers.



Cassinia quinquefaria

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Back cover

Hibbertia scandens:

Hibbertia—after George
Hibbert, a London patron of
botany; *scandens*—climbing
(tendency to climb)

Front cover

Brachysema lanceolatum:

Brachysema—derived from the
Greek, *brachys*, short, *sema*,
standard (alluding to the pea
flowers); *lanceolatum*—leaves
lancelike in form.